MYCOTAXON

ISSN (print) 0093-4666 (online) 2154-8889 © 2016. Mycotaxon, Ltd.

April–June 2016—Volume 131, pp. 385–390

http://dx.doi.org/10.5248/131.385

New species of *Dictyochaeta* and *Wardomyces* from soil

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Abstract — Three new species, *Dictyochaeta brachysetula*, *D. chinensis*, and *Wardomyces microsporus* from soil in China, are described and illustrated. The type specimens (dried cultures) and living cultures are deposited in the Herbarium of Shandong Agricultural University, Plant Pathology (HSAUP), and the Herbarium of Institute of Microbiology, Academia Sinica (HMAS).

Key words — asexual fungi, dematiaceous hyphomycetes, taxonomy

Introduction

The genus *Dictyochaeta* was established by Spegazzini (1923) and is characterized by macronematous, mononematous, septate, pale brown to dark brown conidiophores that produce mono- or polyphialidic, sympodially proliferating conidiogenous cells that often have conspicuous and flared collarettes. Frequently, sterile or fertile setae are associated with the conidiophores and together these can form small clusters originating from a knot of superficial hyphae. The conidia are hyaline, smooth, and typically falcate (but can be ellipsoid, clavate, fusoid, or cylindrical), 0–1(–3)-septate, and with or without setulae (Whitton et al. 2000).

Wardomyces, established by Brooks & Hansford (1923), is characterized by semi-macronematous, mononematous, straight or flexuous, hyaline or subhyaline, smooth, branched conidiophores that produce polyblastic, penicillately arranged, determinate, ampulliform, subspherical, clavate, doliform or ellipsoidal conidiogenous cells. Conidia are solitary, acropleurogenous, ellipsoidal, ovoid, oblong rounded at the apex or navicular, often truncate at the base, brown or blackish brown, smooth, each with a longitudinal germ slit, 0–1-septate. MycoBank lists eight species of this genus.

During a survey on soil dematiaceous hyphomycetes in China, two *Dictyochaeta* and one *Wardomyces* species were obtained that did not match with other congeneric species and are therefore described as new taxa. They

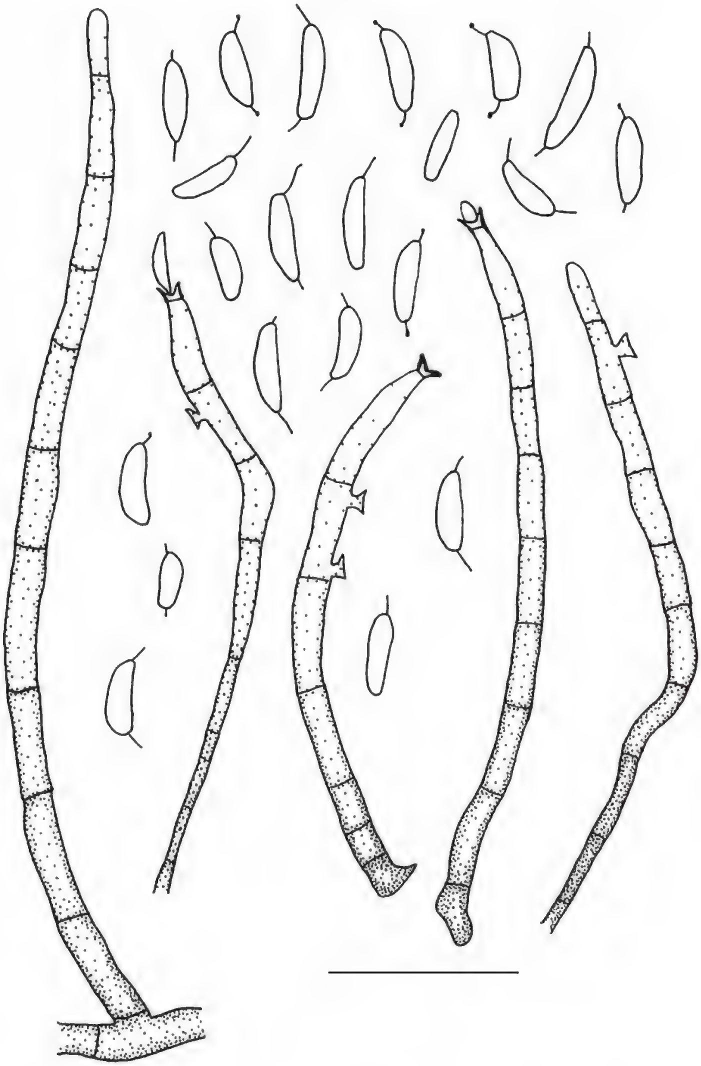

Fig. 1. *Dictyochaeta brachysetula* (ex holotype HSAUP II$_{06}$9038). Conidia, setae, conidiophores, and collarettes. Scale bar = 25 µm.

were isolated onto potato dextrose agar (PDA) and are described from this medium. Specimens and living cultures are conserved in the Herbarium, Department of Plant Pathology, Shandong Agricultural University, Taian, China (HSAUP), and the Herbarium Mycologium, Institute of Microbiology, Academia Sinica, Beijing, China (HMAS).

Dictyochaeta brachysetula Y.L. Jiang & T.Y. Zhang, **sp. nov.** FIG. 1

MYCOBANK MB 815281

Differs from *Dictyochaeta fertilis* and *D. pakhalensis* by its wider conidia and shorter setulae.

TYPE: China, Sichuan Province, Luding County, from a vegetable plot soil, 24 June 2006, Y.L. Jiang (**Holotype**, HSAUP II_{06}9038 [dried culture]; **isotype**, HMAS 196298).

ETYMOLOGY: in reference to the short setulae.

COLONIES on PDA effuse, greyish brown, hairy, reaching 3–4 cm in diameter in 2 weeks at 25 °C. MYCELIUM superficial and immersed; hyphae hyaline to pale brown, branched, septate, smooth, 1–3.5 µm wide. SETAE straight or curved, pale brown to brown, paler and almost always fertile towards the apex where there are persistent collarettes, smooth, ≤380 µm long, 2.5–4.5 µm thick. CONIDIOPHORES solitary or in small groups often associated with setae, rather closely septate, pale brown to brown, smooth, ≤150 µm long, 2.5–4 µm thick, polyphialidic; collarettes funnel-shaped with thick walls. CONIDIA fusiform, curved, hyaline, smooth, aseptate, 7–15 × 2.5–4 µm, with a setula not more than 5 µm long at each end or sometimes only at the apical end.

COMMENTS: In having fertile setae and in morphology of conidia and collarettes, *Dictyochaeta brachysetula* closely resembles *D. fertilis* (S. Hughes & W.B. Kendr.) Hol.-Jech. and *D. pakhalensis* (S.M. Reddy & S.S. Reddy) Whitton et al.. However, *D. fertilis* has narrower conidia (10–15 × 2–3 µm) and longer setulae (5–10 µm; Holubová-Jechová 1984); and *D. pakhalensis* has smaller conidia (6–11 × 1.75–2 µm) but longer setulae (4–8 µm; Reddy & Reddy 1978, as *Codinaea pakhalensis*).

Dictyochaeta chinensis Y.L. Jiang & T.Y. Zhang, **sp. nov.** FIG. 2

MYCOBANK MB 815282

Differs from *Dictyochaeta assamica* by its bigger conidia and shorter setulae.

TYPE: China, Guizhou Province, Leishan County, from a mountain soil, 18 Sept. 2005, Y.L. Jiang (**Holotype**, HSAUP II_{05}1019 [dried culture]; **isotype**, HMAS 196299).

ETYMOLOGY: in reference to the country where the fungus was isolated.

COLONIES on PDA effuse, greyish black, hairy. MYCELIUM superficial and immersed; hyphae pale brown, branched, septate, smooth, 1–2.5 µm wide. SETAE

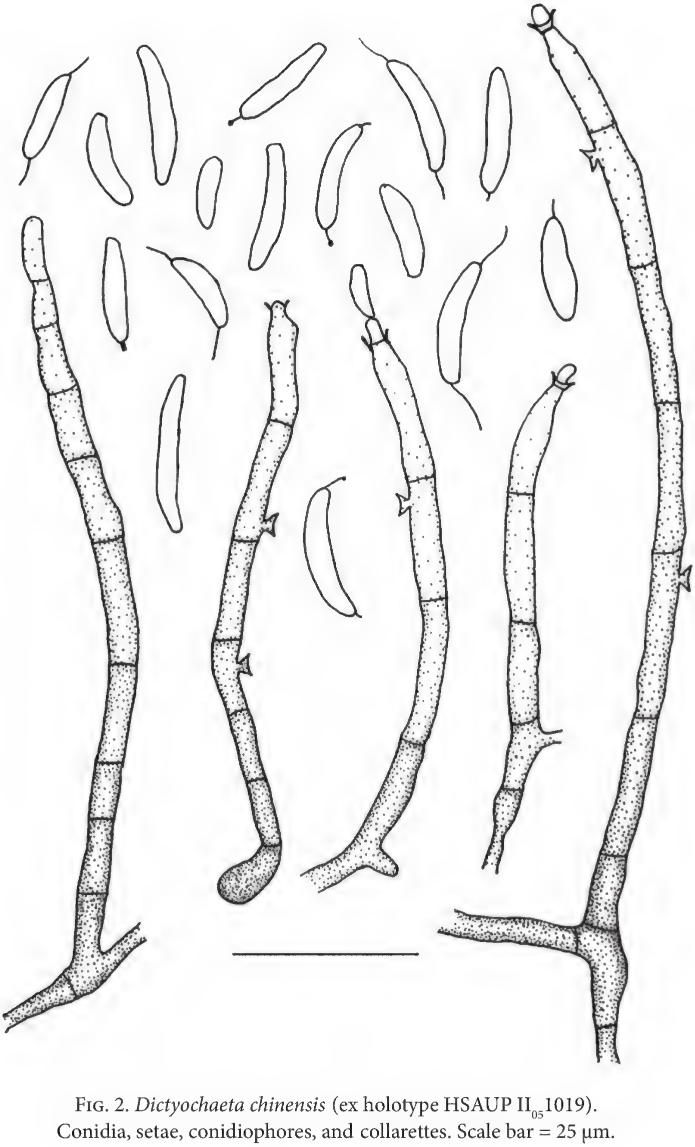

Fig. 2. *Dictyochaeta chinensis* (ex holotype HSAUP II$_{05}$1019). Conidia, setae, conidiophores, and collarettes. Scale bar = 25 µm.

straight or curved, septate, pale brown to brown, paler and almost always fertile towards the apex where there are persistent collarettes, smooth, ≤320 µm long, 2.5–5 µm thick. Conidiophores solitary or in small groups often associated with setae, straight or flexuous, septate, pale brown to brown, smooth, 50–200

× 2.5–4 µm, polyphialidic; collarettes funnel-shaped with thick walls. CONIDIA fusiform or sometimes cylindrical, mostly curved, hyaline, smooth, aseptate, 10–20 × 2–4 µm (commonly 14 × 3 µm), with setulae 1.5–8 µm long, usually on both ends of the conidium but sometimes absent or only on one end.

COMMENTS: Morphologically, *Dictyochaeta chinensis* resembles *D. assamica* (Agnihothr.) Aramb. et al.. However, *D. assamica* has smaller conidia (14–16 × 2.5–3 µm) with longer setulae (9–14 µm) always on both ends (Arambarri et al. 1988).

Wardomyces microsporus Y.L. Jiang & T.Y. Zhang, **sp. nov.** FIG. 3

MYCOBANK MB 815283

Differs from other species of *Wardomyces* by its smaller ellipsoidal, subspherical, or broadly ovate conidia.

TYPE: China, Hubei Province, Huanggang City, from a vegetable plot soil, 12 Oct. 2004, Y.L. Jiang (**Holotype**, HSAUP II_{04}6201 [dried culture]; **isotype**, HMAS 1962100).

ETYMOLOGY: in reference to the small conidia.

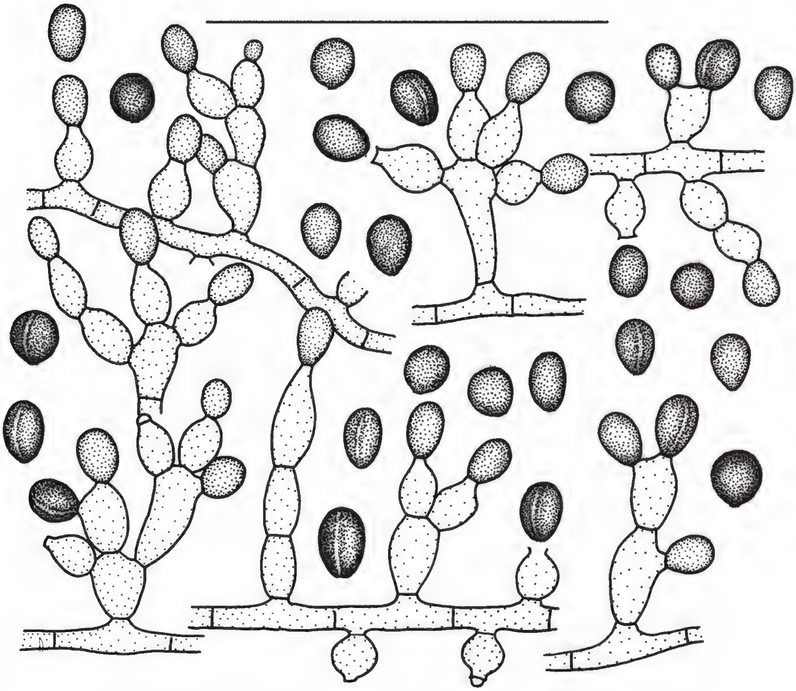

FIG. 3. *Wardomyces microsporus* (ex holotype HSAUP II_{04}6201). Conidia, conidiophores, and conidiogenous cells. Scale bar = 25 µm.

Colonies effuse, black, growing rather slowly on PDA, reaching 0.9 cm in diameter in 2 weeks at 25 °C. Mycelium superficial and immersed; hyphae pale brown, branched, septate, smooth, 1–2.5 µm wide. Conidiophores arising laterally on hyphae, irregularly branched, pale brown, short. Conidiogenous cells terminal, polyblastic, discrete, inflated, broadly obpyriform or subspherical, smooth, pale brown, 2.5–4 × 2–2.5 µm. Conidia arise successively, ellipsoidal, subspherical or broadly ovate, obtuse at the apex and slightly truncated at the base, aseptate, smooth, thick-walled, nut-brown to dark brown, 2.5–4.5 × 2.5–3 µm, with a single longitudinal pale-colored germ slit through which a lateral germ tube develops on germination.

Comments: The other seven accepted *Wardomyces* species—*W. anomalus* F.T. Brooks & Hansf., *W. columbinus* (Demelius) Hennebert, *W. humicola* Hennebert & G.L. Barron, *W. inflatus* (Marchal) Hennebert, *W. moseri* W. Gams, W. *ovalis* W. Gams, and *W. pulvinatus* (Marchal) C.H. Dickinson—have larger conidia, mostly navicular, ellipsoidal, or oblong (Ellis 1971; Gams, 1968, 1995; Hennebert 1968).

Acknowledgments

The authors are grateful for pre-submission comments and suggestions provided by Drs. Eric McKenzie, Yong Wang, and Shaun Pennycook. This project was supported by the National Science Foundations of China (nos. 30970011 & 31360012).

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